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ABSTRACT

Thorough investigation of scheduling options is needed to facilitate the development of a tailor-made schedule for the small school. The traditional scheduling model usually only works well in urban or suburban schools. When this mass production model is imposed on small schools, student needs become secondary to the dictates of the schedule. The traditional model offers security and ease of scheduling work experience programs. But it restricts teaching strategies, flexible grouping, individualized instruction, and independent study. The rotation model allows for more course offerings, varying optimum learning times, and reduction of daily teacher preparation, but must allow for meeting the prescribed instructional time. The modular model offers variations in the choices of time patterns for class periods, instructional practices, and number of students in group settings, but must have a minimum of 2 years planning, flexible physical space, and monitoring of students during their unscheduled time. The vertical model is based on individualized pacing and continuous student progress and allows for an expanded elective program but requires more initial planning, use of learning centers, more complex record keeping by teachers and an adjustment of the role of the teacher. Other scheduling considerations include term length, frequency of course offerings, team teaching, and learning centers. Addendum tables present: (1) in-house options for maintaining a broad curriculum; (2) options for using outside resources; and (3) use of new technologies to maintain a broad curriculum. (ALL)

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Literature Search on the Question: **What are the advantages and disadvantages of various scheduling options for small secondary schools (high school and middle schools)?**

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A school's curriculum is little more than words until it is actualized through an established schedule. The schedule is the time-management tool that enables the implementation of educational programs and objectives (Shaten, 1982). Since the school's curriculum should be representative of the school's educational philosophy, the scheduling process should be harmoniously and directly related to that philosophy. The school's scheduling model should reflect district and community curricular philosophy, staff strengths, and needs of the students and community (Dempsey and Traverso, 1983).

There are two questions that should be asked before starting to work on changes in the scheduling model:

1. Why is the present scheduling model used and what are its weaknesses and strengths?

2. Is there a better way to achieve educational goals and objectives?

Significant changes to a schedule require thorough planning to ensure successful implementation. Effective planning usually requires two years before implementation and should involve administrators, teachers, support staff, the school board, parents and community representatives. Each school's scheduling program is unique because of varying school conditions, past experiences, available staff and student needs. Development of innovative, creative schedules depends on the following:

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1. Willingness to break from dictates of the past and leave behind self-imposed restrictions

2. Knowing the educational needs of the students being served

3. Knowing what is desired for the students to learn

When establishing the schedule, considerations must be given to state and district mandates, staffing restrictions, student needs and facility limitations. The following questions are designed to assist in planning for changes in the schedule.

State and district mandates: Will the schedule provide the minimum class contact hours - will there be quarter, semester, trimester, or year courses? How many class periods will there be each day? Will every class meet every day? What will be the length of each class period? Will each course be offered every year? Will students be able to meet prescribed graduation requirements with the schedule?

Staffing restrictions: How will the schedule accommodate shared staffing with other schools in the district? How will the schedule impact part-time staff? Are there specialized courses which require unique staff qualifications? Are there contract limitations on teacher load assignments? What are teacher strengths and preferences?

Student needs: Will the schedule promote student learning? What should happen educationally to the students (beyond course offerings, what are desired student outcomes relative to attitudes, values, behaviors, content knowledge and experiences)? How many limitations will there be on student electives because of scheduling conflicts? Will there be minimum course enrollment numbers? Will there be more than one section of a particular course to avoid scheduling conflicts? Will the schedule accomodate the differing aspirations of students, i.e., college preparation courses, vocational education courses?

Facility limitations: Will the schedule allow flexibility in room assignments for large or small class meetings? Are there seating restrictions in classrooms? Will study halls be scheduled? If learning resource centers (i.e., language labs, science labs) are utilized, will there be adequate equipment and supplies available? How and where does the lunch period fit into the schedule?

As previously stated, every school's schedule is unique. However, the majority of secondary schools in the United States use a traditional (conventional) model, sometimes referred to as the mass-production classroom model, which builds on ability grouping, subject matter and grade level divisions, teacher specialization and separation of teaching from administration. This model, which works quite efficiently in urban/suburban schools, is dependent upon a critical

secondary schools (Sederberg, 1983). Scheduling for a small, secondary school is more than a matter of implementing a "one-size-fits-all" perspective. Too frequently, when the mass-production model is imposed on small, secondary schools, student needs become secondary to the dictates of the schedule. Thorough investigation of a variety of scheduling options is needed to facilitate the development of a "tailor-made" schedule for the small school.

This report addresses advantages and considerations of some basic scheduling options. Although there may be some disadvantages with a particular plan, those obstacles can be overcome through detailed considerations. Therefore, this report will regard potential disadvantages as "considerations" to be made in the planning process.

The scheduling themes covered by this report include the following:

1. Traditional (or conventional) scheduling
2. Rotation scheduling
3. Modular scheduling
4. Vertical structuring

This report concludes with a selection of other considerations that should be made while planning for any changes in a school's master schedule plan.

Also offered as an addendum to this report are three tables that were prepared by the Rural Education Program of Northwest Regional Educational Laboratory as part of a report on the advantages and disadvantages of small, rural high schools. These tables are offered for your review. You may find the information helpful as they address options by which small secondary schools can maintain a broad curriculum.

TRADITIONAL (CONVENTIONAL) SCHEDULING

With a traditional schedule, all classes meet the same time every day for equal lengths of time. Exceptions would be courses that may meet fewer days a week such as science labs or physical education classes. Every week is the same for teachers and students. This type of scheduling is used in the majority of secondary schools as it offers simplicity (Dempsey and Traverso, 1983).

Advantages:

1. Work experience programs for students are easily scheduled.
2. There is little difficulty in scheduling part-time and shared staff.
3. The unchanging style of the traditional schedule offers security in that it is uncontroversial.

Considerations:

1. Teachers are limited to use those instructional strategies and techniques that fit into a fixed time slot.
2. Variation in class group size (large/small) for integrated instruction is difficult because related classes may not have coinciding periods.
3. There are greater restrictions on individualized instruction and independent course study by students.

ROTATION SCHEDULING

Rotation scheduling offers several features within the structure of a traditional schedule by rotating the class periods of the scheduled day. More courses can be offered by extending the number of class periods without extending the length of the student day. For example, a schedule may consist of seven periods, but only six periods meet each day, and the periods rotate meeting times each day thereby falling in different time frames throughout the week. This schedule would repeat itself every eight days, and once every eight days, each of the periods would not meet. A total cycle interchange rearranges the periods in the school day so that no one course meets at the same time throughout the cycle. The interchange of class meeting times rotates so that students will have a subject first period on one day and last period on another.

If total cycle interchange is not feasible, a morning/afternoon interchange may be considered. With this modification, there would be separate and distinct interchange during the first half of the student day and another during the last half of the student day. Half-day rotation allows for more flexibility in the utilization of shared or part-time staff.

Advantages:

1. By reducing the number of scheduled periods per day, classes can meet for a longer period of time, and the rotation scheduling also allows for more courses to be offered within the schedule.

2. Students have the opportunity to meet in their selected courses at different times during the day, thus varying their optimum learning times for all courses.

3. This schedule variation can reduce the daily demands of teacher preparation.

Considerations:

1. The schedule must allow for meeting total student contact (instructional) time per course-credit within the prescribed term (i.e., quarter, semester), as mandated by state standards.

2. If a morning/afternoon rotation is used, an even numbered period schedule works more efficiently.

MODULAR SCHEDULING

Modular scheduling offers variations in the choices of time patterns for class periods, instructional practices, and number of students in group settings. The student day is divided into mods with each mod generally being 20 to 30 minutes in length. The number of mods that a particular course will meet can vary from day to day or be the same for each day. For example, certain subjects, such as Algebra I, may be offered for two 30 minute mods each day whereas physical education and art may be offered for three such mods every other day. Courses may be scheduled for large group meetings on one day and small group meetings on other days.

Advantages:

1. The variety of choices for time patterns is unlimited.
2. Small group activities (i.e., discussions, simulations) can reinforce large group instruction.
3. Team teaching and integrated thematic unit instruction can be easily incorporated into a flexible modular scheduling format.
4. Implementation can be based on departmental needs and a conventional framework can operate within the flexible schedule.

Considerations:

1. A minimum of two years planning is recommended before implementation of a varied, flexible modular schedule.
2. Flexibility in scheduling physical space (facilities) for varied sizes of class meetings (large/small group, independent study) is necessary.
3. With a highly flexible modular schedule, some unscheduled time for students will result. Therefore, plans on how students are to be monitored during such time are necessary (i.e., study halls, learning centers).
4. All faculty should participate in advising students to assist them in making good decisions on use of instructional time and unscheduled mods.

VERTICAL STRUCTURING

Vertical structuring is a flexible scheduling technique that is based on individualized pacing and continuous student progress and allows for a generalized expanded elective program (Book, 1984). This structure is well suited for those courses that go beyond the "first year", i.e., foreign languages. It offers a workable solution to satisfying enrollment minimums and adds depth to the small school's curriculum. For example, most schools require four years of English, and, traditionally, these requirements are provided in the sequence of English I, II, III, and IV with all four courses offered every year. The enrollment restrictions for each course are based on students' respective grade levels rather than specific skill development. Vertical structuring of the English program would remove grade barriers to course enrollment and allow for thematic English course offerings (i.e., European literature, American literature, writing and composition skills). This could also provide the option of offering fewer English courses each year, and allow for courses to be offered in alternating years with enrollment open to all students..

Regardless of age (or grade), students can schedule a course during the period where the course option appears on the master schedule. Students negotiate long-term contracts for each term (quarter or semester) and short-term contracts on a daily/weekly basis. For each lesson, a checklist of all requirements is given to the student.

Advantages:

1. Vertical structuring offers a workable solution to satisfying minimum enrollment requirements.

2. Depth is added to the curriculum of a small school in that students can pursue advanced study through individualized programs.

3. Instruction is student-centered because not all students scheduled for the same class period of a course will be studying the same level of that course subject.

Considerations:

1. Initial planning for vertical structuring requires time, energy and concentrated effort of teachers. Additional preparation time in the form of extended contract days is recommended for planning the transition to and implementation of vertical structuring concepts.

2. Teachers must have a strong grasp of the subject matter, and they must keep more complex records as students' continuous progress must be monitored on an individual basis.

3. Teachers must adjust their roles: They will be facilitators of student learning rather than hold center-stage in the instructional process.

4. Utilization of learning centers for each subject area in a vertical structure program facilitates greater student learning opportunities.

OTHER SCHEDULING CONSIDERATIONS

Term Length:

State and district standards will mandate the number of credits in specific courses that are required of a student for graduation from high school. Within these mandates, there may be allowable variation as to how a school divides the school year into terms, i.e.,., quarters, semesters, or trimesters.

Within a master schedule, some courses can be scheduled for semester credit, and, at the same time, others can be scheduled for quarter credits. Quarter scheduling can increase the number of course offerings while not interfering with courses that will be offered for one or two semesters.

Using trimester scheduling can also expand the number of course offerings within the yearly schedule framework. If a trimester approach to scheduling is adopted, it should be for all courses. Exceptions would exist for "mini-course" - those which would be for designated increments of the trimester. It is the mini-course feature of a trimester schedule that enhances its adoption for middle schools: mini-courses provide ideal exploration opportunities for middle school aged students.

Frequency of Course Offerings:

Secondary schools have certain courses which must be offered every year, regardless of the number of students enrolled, in order that students can acquire required credits toward graduation. However, elective courses may be offered only if a specified minimum number of students enroll. In small schools, this may mean that a desired course is never offered because enrollment figures

are too small. To compensate for this problem, some schools rotate course offerings on a yearly basis. An example would be to offer chemistry and physics in alternate years. Some course offerings may be suitable for rotation on a semester basis, i.e., small engines one semester and power mechanics the second semester.

By alternating years or semesters for elective course offerings, students are not deprived of the elective options, and teachers receive some relief from excessive preparation demands.

Small Alaska high schools typically rotate courses on yearly plans wherein a course may be offered every other year or only once in four years (Kleinfield, McDiarmid and Hagstrom, 1985). In circumstances where a course is offered only once in four years with all students enrolling, the teacher assigns work that is appropriate to students' academic skills. Imaginative educational strategies are essential with respect to scheduling because communities want more offerings and electives for the students in their schools.

Instructional Option for Team Teaching:

Schools should always consider how the schedule will impact the student-teacher relationship, but the teacher-teacher relationship should also be an issue that influences the schedule that is adopted Too frequently, at the secondary level, the one-room school is still alive and flourishing. This statement is not meant to demean those existing one-room schools, but it is offered as an expression to demonstrate the element of turfism that can be prevalent among secondary teachers. Hopefully, teachers will want to work as a team to benefit the learning and achievement of their students. The extent to which the concept of team teaching is carried out will determine variations in the structure of the school's schedule.

When students are instructed by a teaching team, they are exposed to strengths of different teachers and experience a variety of instructional strategies. Teachers also benefit because they can observe other types of teaching and experience greater instructional flexibility (Martin and Pavan, 1976). Team teaching requires teachers to harmoniously work together toward common goals. Teachers must relinquish notions of ownership to particular classrooms and be willing to share.

When a transition is made to incorporate team teaching strategies, there must be clear understanding of educational goals as well as the purpose(s) for changing to a team teaching format. Generally, teachers have a positive view of

team teaching because of greater variety of instructional creativity. In a study conducted by Bair and Woodward (as cited by Martin and Pavan, 1976), there were no significant differences in (middle school) student achievement when comparing team teaching to individual self-contained teacher instruction, nor were there any detrimental effects on cognitive or affective outcomes as a result of team teaching.

As stated above, team teaching is dependent upon cooperation among instructional staff members. When there are circumstances of personality clashes among staff, team teaching can fail to meet desired outcomes. Success of team teaching techniques also relies upon staff having adequate, mutual preparation time which is needed to integrate instructional materials.

Learning Centers:

Utilizing learning centers can provide a multi-grade, multi-course approach to the organizational structure of a school's schedule. Learning center instructional activities can work effectively with small groups to promote cooperative learning which, in turn, enhances student achievement. The teaching-learning relationship is personalized, and the specialized help maximizes opportunities for individualized instruction.

Small 7-12 schools, with enrollments under 200, that use learning centers and a system of vertical structuring within the schedule can offer the same (or a better) program of courses as schools with enrollments of 375 (Sederberg, 1983). This is assuming that there are at least nine teachers and a six period day.

There are no formal class presentations in learning centers. Well trained paraprofessionals can manage and supervise learning centers, but close and on-going communication and cooperation with teachers is mandatory. Although the initial set-up of learning centers requires more preparation for organizing, locating and adapting materials, there are not the day-to-day demands on teacher time once centers are established. By extending the number of teacher contract days or providing an additional preparation period for teachers, these implementation concerns can be met. Learning centers can be consolidated or combined as necessary, i.e., social studies and English, science and math.

CONCLUSIONS AND RECOMMENDATIONS

If there is one thing that all secondary schools share in common, it is the fact that each school has its own unique features. Because of this reality, there is

every reason why schedules of schools will also have unique elements. A successful schedule is one that works efficiently for staff and students as it enables the implementation of the curriculum. Schedules should be regarded as flexible time-management tools that evolve to best serve the educational needs of students.

Imposing a scheduling model on a school will not ensure its success: careful and thorough planning is essential. There cannot be too many questions asked during the planning process, and it is vital that representatives of all constituents of the school community be involved in the planning stages. Throughout this report, suggestions have been made to stress that time is needed for planning schedule changes. The degree of change from the current schedule will dictate the amount of time needed. Generally, a two year time-line is recommended to provide adequate exploration of options and evaluation of how those options will meet the needs of the school. Regardless of the options adopted or time available, PLAN, PLAN, PLAN.

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ADDENDUM

Table 1: In-House Options for Maintaining a Broad Curriculum

Table 2: Options for Maintaining a Broad Curriculum Using Resources Outside the Schools

Table 4: Application of New Technologies for Maintaining a Broad Curriculum

Table 1
IN-HOUSE OPTIONS FOR MAINTAINING A BROAD CURRICULUM

OPTION	POTENTIAL ADVANTAGES/DISADVANTAGES	COMMENT
1. Related Courses Combined Combine the teaching of related courses in the same classroom. An example would be the combined teaching of French III and French IV.	Advantages Courses are held which otherwise would have been cancelled. Disadvantages Less relevant or appropriate instructional time is available for each student.	
2. Alternate-Year Offerings A particular course is offered every other year.	Advantages Demand for a course may "backlog" during the off-cycle year, making enrollment demand higher. Disadvantages An alternate year system is not feasible for most sequential and core courses. Student-to student communication on course suggestions is reduced for alternate year courses.	Alternate-year offerings are heavily used in higher education.
3. Multiple Certification of Teachers Recruit or retrain staff to attain teachers with instructional strengths in two or more disciplinary areas.	Advantages The possibility that a course will not be offered because a certified staff person is not available to teach a course will be reduced. Disadvantages Technical certification which has not been practiced for many years may be instructionally less effective.	Not all small, rural schools have current information on multiple certifications held by teachers.
4. Interdisciplinary Courses An interdisciplinary course combines the content and perspective of two or more disciplinary areas into a single course offering.	Advantages Courses which cannot be run separately (for example, Art History) may be delivered to students as part of an interdisciplinary course (for example, History and Culture). Disadvantages Breadth of coverage of a course is likely to be reduced in an interdisciplinary format.	

Table 1-Continued
IN-HOUSE OPTIONS FOR MAINTAINING A BROAD CURRICULUM

OPTION	POTENTIAL ADVANTAGES/DISADVANTAGES	COMMENT
5. Increased Student Course Load By increasing credit requirements or increasing the number of instructional periods per day, students are encouraged to take a larger number of total courses.	Advantages If more courses are taken, many students will have available slots to take elective courses less popular courses. Disadvantages If credit requirements are highly restrictive, options for students may not increase. A large number of courses can result in reduced attention to each course by students.	
6. Innovative Strategies and/or Models of Instructional Delivery Allow a combination of large group lectures, independent team projects or other non-traditional formats.	Advantages Teaching time may be used more effectively when options for delivery of education are flexible. Disadvantages Not identified.	
7. Independent Study Students study a course independently under the guidance of a staff supervisor.	Advantages Students are able to take a course which is either not offered, or which conflicts with another course that must be taken. Disadvantages Independent study lacks the advantages of direct teacher instruction and classroom interaction.	Independent study is in use by many smaller districts. Scheduling conflicts are often the stimulus which leads to use of independent study.
8. Flexible Policy on Minimum Enrollment Using a locally defined process, allow certain courses to be conducted with very low enrollments.	Advantages Courses considered important for a high quality educational program are available to students. Disadvantages The unit of per-pupil cost of operating the	The availability of a teacher sometimes impinges on the decision to offer a low enrollment course or section.

Table 2

OPTIONS FOR MAINTAINING A BROAD CURRICULUM USING RESOURCES OUTSIDE THE SCHOOLS

OPTION	POTENTIAL ADVANTAGES/DISADVANTAGES	COMMENT
1. Use of Community Resources Expand the school into community sites or bring teachers from the community into the school.	Advantages Duplication of facilities and equipment in one community is avoided. Specialized instructors may be used on a part-time basis to enhance the educational program. Student involvement in a "real-world" environment can have motivational and educational benefits. Disadvantages Certification requirements may reduce the feasibility of this option.	It is critical to have a community support base in order to motivate community involvement. Often, using community resources will begin the process of building desired support.
2. Correspondence Courses Packaged courses mailed by other institutions are taken by individual students.	Advantages The range of courses available to a student is enormously broadened. Disadvantages The quality, cost, and supervision of correspondence courses are potential drawbacks.	
3. Expanded School Mission The resources of the high school are used to teach segments of the population not traditionally served by the high school. This could include dropouts, business employees, retired persons, etc.	Advantages By adding clients, the school can maintain a larger curriculum and employ a larger and more varied staff of teachers. Disadvantages Not identified.	Some would argue that the mission of the schools is already too broad. The effectiveness of teaching high school students in the company of other population segments (one variation of this option) is open to question.

Table 2-Continued

OPTIONS FOR MAINTAINING A BROAD CURRICULUM USING RESOURCES OUTSIDE THE SCHOOLS

OPTION	POTENTIAL ADVANTAGES/DISADVANTAGES	COMMENT
4. Concurrent High School and Postsecondary Enrollment With concurrent enrollment, students earn credit at both a high school and a specific postsecondary institution. This is somewhat different from "advanced placement" courses where credit-transfer is considered only upon later application to a college.	Advantages Concurrent enrollment at a postsecondary site removes the course enrollment barrier that high school programs face. A concurrent enrollment course delivered at a high school site may increase the popularity of a course, thus increasing the probability that it can be offered. Disadvantages Students may need to pay tuition for courses and provide their own transportation to college sites.	In districts surveyed for this study, concurrent enrollment courses are usually taught by high school staff at the high school. Individual colleges approve courses and teachers for this purpose.
5. Early College Enrollment Students leave high school a semester or year early in order to enroll in a post-secondary program. Typically, the student will have achieved the required number of courses to graduate except for a fourth year of English which is waived as long as an equivalent English course is to be taken at college.	Advantages High school seniors are given the opportunity to advance to postsecondary level courses. Disadvantages Not identified.	This option, if used extensively may reduce the high school's ability to offer its own advanced programs.

Table 4

APPLICATION OF NEW TECHNOLOGIES FOR MAINTAINING A BROAD CURRICULUM

OPTION	POTENTIAL ADVANTAGES/DISADVANTAGES	COMMENT
1. Taped or "Over-the-Air" Instructional Television Prepared programs are transmitted for television reception or video-taped programs are purchased, rented, shared, or created for instructional use.	Advantages Curriculum opportunities are broadened. Disadvantages Not identified.	The ability to control scheduling has improved the attractiveness of this option.
2. Computer-Assisted Instruction Student instruction is directed by computer programs with students at individual work stations.	Advantages Curriculum opportunities are broadened. Disadvantages Quality and effectiveness cannot be assumed. Teacher and classroom interaction are reduced.	This field is rapidly developing and improving.
3. Interactive Telecommunication Technologies, such as cable and satellite communications, allow interaction between instructors and students who may be at several locations. Interaction may just have an audio component, but ideally, it would have, in addition, one-way or two-way video capabilities.	Advantages Curriculum opportunities are broadened. Disadvantages These technologies still have significant financial costs.	These technologies are rapidly developing and can now be considered as real options. Costs have also gone down over the last few years. Often state colleges have the equipment and capability to provide services in this area. NWREL is developing a handbook for rural schools desiring to use this option.